



Munich Personal RePEc Archive

A Rational Theory of Producer's Equilibrium in Fifteen Principles

Jael, Paul

April 2020

Online at <https://mpra.ub.uni-muenchen.de/99456/>

MPRA Paper No. 99456, posted 15 Apr 2020 17:36 UTC

A Rational Theory of Producer's Equilibrium in Fifteen Principles

Paul Jael

April 2020

INTRODUCTION

The marginalist theory of producer's equilibrium has been a cornerstone of mainstream economics for a long time. It is related to such great names as Alfred Marshall, Francis Edgeworth, Arthur Pigou, Philip Wicksteed, Knut Wicksell, Jacob Viner, Frank Knight, Joan Robinson, Edward Chamberlin, George Stigler, Paul Samuelson...

The main features of this theory are:

- Predominance of perfect competition, characterised by a large number of suppliers who take the price from the market and exert no influence on it. There are also models for monopoly, oligopoly and monopolistic competition but these are considered as particularities. The demand curve is horizontal in perfect competition and declining in other market structures.
- Because of decreasing marginal productivity, short-term marginal cost and short-term average costs are increasing. Because of diseconomies of coordination, long-term average cost is also increasing.
- Firms aim at profit maximisation. The way is pursuing production till the point where marginal revenue equals marginal cost. At long term, in perfect competition, entry of new producers appealed by profit induces price decline till the point of no-profit: in perfect competition, it corresponds to the minimum of average cost curve; in other market structures, the point stands at the left of this minimum.

This theory has been challenged more than once in the twentieth century, without losing its predominance. Let us mention:

- The marginalist debate with the *full cost* controversy (1939- 1955);

- Sraffa's critic (1925, 1926) and his restatement of the Ricardian system (1960);
- Mean's theory of "administered prices";
- Heterodox economists as Paolo Sylos-Labini;
- Heterodox ideas inside mainstream economics such as William Baumol's *sales maximisation* (1958) or his "contestable markets" (1982). The search of motives for price rigidity by the *New Keynesians*, originally macroeconomic, contradicts mainstream microeconomics.
- The recent "debunking" of economics by Steve Keen (2001).

A lot of critics and many ideas have been ventured. My conclusion is that there is room and there is a need for alternative microeconomics. From the combination of these ideas, or some of them, grew the personal conception which underpins my MPRA papers "Full Cost, Profit and Competition" and "Price, Target Rate of Profit and Entry Preventing".

Even if personal, the conception presented here is representative of what I read from other authors, especially from Sylos-Labini, an underestimated economist. Heterodox economics is not a structured theoretical corpus, a widespread knowledge, object of teaching, as is marginalism. Approaching heterodox microeconomics may seem entering a labyrinth. For this reason, I propose a presentation of my conception about producer's equilibrium in a structured and concise way: fifteen principles in a logical and instructive order¹. The present paper is only an overview. Argumentation and demonstrations are to be found in the works in the bibliography.

The principles are founded on a hypothesis shared by neoclassical economics: rationality of agents. Each behaviour must be compatible with the pursuit of self-interest. In real life, I admit, not all economic actions reveal such rationality; nevertheless, most errors of neoclassical economics don't proceed from this hypothesis but from a miscomprehension of it.

¹ Where necessary, a comment follows, in another font.

PRINCIPLES

Terminology

For classical economists, cost is the wage bill plus all expenses charged by other enterprises. Profit is the excess of revenue above this. For neoclassical economists, cost includes the normal remuneration of capital besides, which is thus excluded from profit. Both views are informative and justified. In the rest of this article, “cost” means classical cost. Neoclassical cost, I name “gross cost”. Similarly, “profit” means classical profit. Neoclassical profit, I name “net profit”.

1- Perfect competition

Atomistic competition exists, for instance in agriculture, but is very rare in industry and services. A good theory of production grants only few importance to it.

The presence of numerous sellers as in retail trade is not sufficient for exhibiting atomistic competition. In this sort of trade, localisation is an important factor. Buyers are not so mobile, which limits the radius of competition.

2- Oligopoly

Oligopoly is an equivocal concept. Sometimes meaning simply that there are few sellers, sometimes meaning moreover that the of the sellers’ behaviour is too mild, not competitive enough. Confusion comes from two false beliefs: that few sellers implies few competition and that many sellers implies strong competition.

Roy Harrod had understood the problem very well. He suggested that few sellers with strong and with weak competitive behaviour were to be named differently. For competitive oligopoly, he proposed: “free competition with an imperfect market”. Few competitive firms, I name this market structure “competitive oligopoly”.

3- Criteria of competition

Number of sellers and product homogeneity, both highlighted by marginalism, are interesting market features but have no DIRECT effect on competition². They are weak criteria for analysis. The only discriminant criteria are collusion and external barriers. The number of sellers acts only INDIRECTLY by making collusion more difficult. Without barriers and collusion, oligopoly is as competitive as perfect competition.

Already in 1883, when he criticised Cournot's theory of duopoly, the French economist Joseph Bertrand understood that the number of competitors is not determining. According to him, two firms would reduce price till the point of no profit.

An essential element of competition is the potential entry of outsiders for supplying the market. The presence of barriers to prevent this is an enormous advantage for insiders. In the absence of barriers, firms are forced to keep price sufficiently low to make entry less attractive.

Product differentiation is much more common than homogeneity. It is not a real obstacle to competition. Competition prevails if the various products aim at satisfying the same need. Product differentiation does not divide a common market in a series of particular monopolised markets. Monopolistic competition is not an independent market structure.

4- Object of competition

Competition has three possible objects: product quality, cost and marketing. The predominant concept of "price competition" is a lure. What really exists is cost competition which reverberates on price³.

Chamberlin also distinguished three objects of competition: price, quality and marketing. He did not take account of the role of cost in competition. And he was lured by the role of price. When we observe economic activity, it is clear that the major preoccupation of firms is to lower cost of production and other costs.

5- Price competition and profit

More exactly, price competition does exist but it has another sense than the three other objects; in these ones, each firm tries to perform better than its competitors.

² Except when there is only ONE seller.

³ Entry of new competitors can be better understood with this principle. They enter because, rightly or not, they think they have better products or lower costs. Except when the market is growing very fast, they otherwise stay outside.

On the other hand, price competition prevents firms to price above the level bringing normal or average profit. As a consequence, to gain a profit higher than normal, the firm must succeed in other objects of competition such as low cost.

Price includes cost and profit margin. Competing on prices without competing on cost, the marginalist scenario, would mean competing on margins. Competition on cost aims at reducing it as low as possible for a given quality. Competition on margin has to preserve profit. When profit falls below its normal level, it indicates that other causes have come into action than the normal working of competition (cf. *infra*).

6- Demand

As a tool, the demand curve proper to a firm is criticisable. This curve is impossible to be defined without hypotheses about the behaviour of competitors and of the firm itself. What seems inescapable is that no firm is able to rise sales without lowering price in a stationary context. In consequence, we are bound to draw demand curves declining. And most firms are *price makers*, not *price takers*.

Steve Keen has showed that it is true even in perfect competition.

7- Cost

- Short term: particular situations are very variable from case to case, depending on respective parts of fixed and variable costs, the presence of unused capacities and labour hoarding, the divisibility of equipment... Short term average cost can be increasing, constant or decreasing. For generality, the best is to consider it as constant.
- Long term: the argument of coordination diseconomies is an ad hoc one and is not credible. Long term average cost can be increasing, constant or decreasing, depending on the particular characteristics of each production. For generality, the best is to consider it as constant.

Number of economists don't believe any more in "U-shaped" average cost curves⁴. Empirical works (interviews of managers) confirm the lack of credibility of this theory⁵.

As a consequence, cost cannot play the role attributed to it by marginalism: being the factor limiting production scale of individual firms. Fortunately, demand is decreasing and can thus play this role.

⁴ For instance, Piero Sraffa, Philip Andrews, Paolo Sylos-Labini, Herbert Simon

⁵ Cf. Eiteman (1947), Eiteman and Guthrie (1952), Blinder (1994).

8- Profit maximisation

Firms do aim at maximising their profit. Two remarks:

- 1- They want to maximise the remuneration of their shareholders. Marginalist models exhibit maximisation of net profit. The distinction between cost of capital and net profit has no sense from the point of view of shareholders and could be confusing⁶.
- 2- It is long term profit which matters. If an action raises short term profit but creates a danger at longer term, firms will refrain from it. As we shall see in n°9, there are cases of such opposition between short term and long term profit.

I don't dispute that firms try to maximise profit. Casting doubt on profit maximisation has been common among heterodox economists, but I do not share this doubt.

9- The firm's optimum

Translating maximisation of shares value into a price and quantity policy is complex because the optimal rule depends on the context. Let us first suppose that competition operates fully, which implies the absence of barriers. For simplicity, all competitors are supposed having the same product quality and working at the same cost. The firm, to prevent entry of outsiders, will choose a price equal to average gross cost and sell its product until the point where average revenue (price) equals average gross cost.

This price is what has been called "full cost" by some authors. I give here the formula expressed by Sylos-Labini (1971, p.248)⁷:

$$p = v + \frac{k}{x_n} + r \frac{K}{x_n}.$$

p is price

v is unit variable (or, better, *direct*) cost

k is total fixed cost

⁶ Maximisation of net profit attracts new competitors and finally hampers the maximisation of gross profit. The marginalist models avoid this contradiction because they ignore entry prevention.

⁷ Sylos distinguished between the STATICS of price setting and the DYNAMICS of price variation. According to him, the *full cost* formula is only an explanation of how firms adjust price when a parameter of cost or of demand changes. His analysis of price determination leaves much freedom to the *price leader* discretion. I cannot agree with this distinction. I consider the full cost formula as the most rational way to set price.

x_n the reference quantity
 r is target rate of profit
 K is capital engaged

The Marshall-Viner-Robinson model which dominates neoclassical economics in this field states that quantity produced is optimal when marginal revenue equals marginal cost. This is only a temporary equilibrium because net profit will attract new firms on the market, making price fall. Full equilibrium is achieved when we have the double equality of average revenue (price) with average cost and marginal revenue with marginal cost⁸.

This is a short-sighted behaviour. Acting this way, the firm loses potential revenue and probably potential profit. It would have been preferable to fix immediately a price that does not attract new firms so as to quote the (finally) same average gross cost price with larger outlets. Preventing entry by an adequate pricing is a subject much treated in literature; see Andrews (1959), Harrod (1952), Sylos-Labini (1962,1971), Bain (1950), Modigliani (1958), Bhagwati (1970). As observed by Harrod, outsiders are not necessarily young or small firms having to grow before becoming as strong as insiders; large businesses may try to diversify their production.

In interviews of entrepreneurs of large companies conducted by Lanzillotti (1958), achieving a *target return of investment* was the most quoted pricing objective.

10-Equilibrium and disequilibrium

If we consider average cost as the firm's supply curve, rule of principle n°9 results in a stable equilibrium, except when simultaneously returns to scale are increasing and demand is more sloped than supply. But stability is not an important point because in case of disequilibrium, the firm's first reaction is to alter, not price but quantity. If supply exceeds demand, production will be reduced and the firm will try to keep price unchanged. Only when excess supply is very large and durable, will the firm, relentlessly, accept to add price reduction to quantity reduction.

This point relates to one of the most discussed items in modern economics: price rigidity. The orthodox view is perfect flexibility of prices; the corollary is that variations of production and sales are limited. The image given by actual markets seems at the opposite: price is rigid, not fully rigid but significantly, and there are large variations of production and sales. The *New Keynesian* school has made its speciality to find motives for price rigidity. There are also a lot of empirical studies.

The option of enterprises to let quantity vary rather than price is rational. It is a way to reduce uncertainty. Considering an equal change of revenue (sales time price), profit with

⁸ Only in perfect competition are the four variables equal at full equilibrium.

variable price and fixed quantity will fluctuate more than profit with fixed price and variable quantity.

11-Market equilibrium

Because of competition, market price must be unique⁹. Let us first suppose that the product is homogenous. What happens if there are differences of productivity between suppliers? All firms must obtain the normal rate of return¹⁰. So the cost which sets price is the cost of the least productive supplier, as happens with the price of corn in the Ricardian system. Since firms generally ignore the costs of their competitors and their place in the race for low cost, price setting gives rise to a trial and error process. This process is a phase of observation and uncertainty. In this phase, firms do not have full control on price, which could give them the false impression they behave as price takers.

Explanations of how a market price emerges in an oligopolistic situation are to be found in Sylos-Labini (1962), Lanzillotti (1957) and Farm (2014).

When analysing the emergence of market price, we have to avoid ideological-type controversies as between the camp of “cost determines price” and the camp of “demand determines price”. Obviously, both forces are acting, but via different channels. Firms set the price on basis of cost, but demand selects which firms are needed by the market and consequently which costs are eliminated from price determination¹¹.

Another difficulty is that full cost results from a formula in which some parameters (e.g. quantity produced taken as reference) are subjective and thus subject to variations between firms. This adds to the difficulty of finding a common view about the right price. But this obstacle is not insurmountable.

⁹ As noted by J.S. Mill and Knut Wicksell, this principle can only be applied if each customer and each seller does his job and seriously searches the best opportunity. To be sure, it is impossible for the consumer in the street to gather full information about prices in a short time. But markets tend to this unique price. This assumption is reasonable.

¹⁰ Obtaining the normal rate of return is a characteristic of an equilibrium situation. In real economic life, firms do not permanently succeed and sometimes make losses. Avoiding a sanction from the stock market implies then that they realise a recovery.

¹¹ So, the cost which sets price is the cost of the least productive supplier WHICH IS NEEDED BY THE MARKET.

12-Normal profit and extra-profit

First source of extra-profits

In a situation characterised by a unique market price and disparity between costs, the more productive firms realise extra-profits.

Second source of extra-profits

Without the threat of new competitors to level profits, firms protected by barriers gain extra-profits. According to Sylos-Labini, the target profit rate used by a firm when pricing already incorporates the advantage of barriers (1971, p.256).

If the extra-profits are expected by the stock-market, the enterprise capitalisation increases. In this situation, extra-profits have a double nature: from the stock market point of view, they enter the normal cost of capital which has increased; from the product market point of view, they are extra-profits.

13-Product quality

Let us drop out the product homogeneity hypothesis. The rule becomes that there is a single price... for a determined quality. Better quality products can be sold more expensive. Thus, higher productivity gives firms an alternative means to get extra-profits. Better quality at the same cost has the same effect on profit as equal quality at lower cost. Competition becomes a race to maximise the quality-cost-ratio. A result is market segmentation based on customers budget. Some of them have enough resources to pay high prices for high quality; other ones, hard-constrained by their budget, choose cheaper products.

14-Demand and firm scale

Market demand is an exogenous variable. Firm demand is an endogenous one. It results from the behaviours of competitors and of the firm itself. It often happens that firms sell less than their potential demand, as a deliberate choice of the entrepreneur for motives which are personal to him. For instance, the desire to keep control on his business. There is nothing irrational in this. What matters is to obtain the normal rate of profit.

If firm F does not exhaust its demand, that induces an increase of demand to its competitors; and if competitors increase their supply to satisfy this demand, it entails a reduction of firm F 's demand. At equilibrium, each firm meets exactly its

demand but its previous behaviour has influenced this demand.

Large companies try to exhaust their demand, because a wide occupation of the market is an excellent and cheap advertising. It is a kind of insurance against future decline.

Exhausting its potential demand is a way of reducing uncertainty. Harrod uses the words “insurance against future uncertainty” and explains: “...present sales improve future prospects and have their own importance on this account” (1952, p.174). We find the same idea in Andrews (1949, p.92).

15-The business cycle

Mainstream economists worry about granting microeconomic foundations to macroeconomics, but they do not even think of macrofoundations for microeconomics. And yet the *whole* exerts an influence on its *elements*. Firms understand that demand is subject to cyclical fluctuations and they adapt their behaviour to that reality. A major illustration is the rate of return r of formula in principle 9. Firms try to obtain it on average on a period spreading on years. They know that it would be unrealistic to expect it yearly.

About observation of price movements by the entrepreneur, Lucas wrote: “Of the many sources of risk of importance to him, the business cycle and aggregate behavior generally is, for most agents, of no special importance, and there is no reason for traders to specialize their own information systems for diagnosing general movements correctly” (1977, p.21). Few managers will recognise themselves in this description. Entrepreneurs are generally well informed about the evolution of the business cycle and its effect on their own sector’s demand; they take account of it.

The effect of business cycle on profit margin has been much analysed and debated. In the literature, we find demonstrations of procyclical, acyclical and contracyclical fluctuations. It is to be supposed that many parameters have an influence on the cyclicity of profit margins. The movements of profit margin do not necessarily correspond to those of the profit rate which is also influenced by quantity sold.

CONCLUSION

These fifteen principles constitute a whole which describes, coherently -or so I hope-, the functioning of a normal product market, focusing especially on suppliers behaviour of. Neoclassical theory of consumption, though not perfect- as showed

by Steve Keen¹², seems more solid than the theory of the producer. Neoclassical theory of production claims to be founded on rationality but some conducts it recommends could lead the firm to bankruptcy. A firm should better be looking for long-term, not for short-term profit.

Are the fifteen principles presented here rational? Each reader will make up his own mind. If these principles are rational, then neoclassical theory of production is not. Empirical studies show a predominance of *full cost* pricing in real business, as showed by Nubbemeyer (2010, p.38). From the perspective of evolutionary theory of the firm devised by Alchian and Friedman, this predominance reveals its superior efficiency.

Why did neoclassical economists venture into false roads? They were driven, not by realism, but by easy modelling. The concepts they use are especially well fitted for modelling and mathematic treatment. The result is a coherent and very elegant theory. Unfortunately, reality is more chaotic, more difficult to apprehend. Some very important features of real economic life, as product quality, level of collusion, threat of entry of outsiders... do not even have a unit of measurement, making mathematic treatment almost impossible. The assumptions of neoclassical economics are not only simplifications; they also create a parallel conceptual world, which behaves differently from the real world.

REFERENCES

- Andrews, P.W.S. 1959. *Manufacturing Business*. Macmillan London.
- Bain, Joe S. 1950. "A Note on Pricing in Monopoly and Oligopoly". *American Economic Review*, vol 39: 448-464.
- Bhagwati Jagdish N. 1970. "Oligopoly Theory, Entry Prevention, and Growth". *Oxford Economic Papers*, Vol. 22 n°3 (nov), 297-310
- Baumol, William J. 1958. "On the Theory of Oligopoly". *Economica* 24 (99): 187-198.
- Baumol, William J. 1982. "Contestable Markets: An Uprising in the Theory of Industry Structure". *American Economic Review*. 72 (1): 1-15.
- Blinder Alan S. (1994) "On Sticky Prices: Academic Theories Meet the Real World". *Monetary Policy*, Gregory Mankiw (éd), The University of Chicago Press: 117-154.
- Bertrand, J. 1883. "Théorie des richesses". *Journal des savants* (septembre) : 499-508.

¹² A whole chapter of « Debunking Economics » is dedicated to the shortcomings of demand theory. Think for instance of the difficulty of aggregation because of the Sonnenschein-Debreu-Mantel theorem.

- Chamberlin, Edward Hastings. 1962. *The Theory of Monopolistic Competition*. Harvard University Press, Cambridge Massachusetts.
- Cournot, A.A. 1880. *Œuvres complètes*. Tome VIII *Recherches sur les principes mathématiques de la Théorie des richesses*. Librairie philosophique J.Vrin Paris.
- Edgeworth, Francis. 1933. *Papers relating to Political Economy*. Volume 1, Thoemmes Press Bristol.
- Edwards, H. R. 1955. "Price Formation in Manufacturing Industry and Excess Capacity". *Oxford Economic Papers* 7 (1) dec : 94-118.
- Eiteman, Wilford J. 1947. "Factors Determining the Location of the Least Cost Point". *American Economic Review*. 37 (December): 910-918.
- Eiteman, Wilford, and Glenn E. Guthrie. 1952. "The Shape of the Average Cost Curve". *American Economic Review*. 42 (December): 832-838.
- Farm, Ante. 2014. "Competitive Price Leadership". www2.sofi.su.se/~afa/docs/Competitive_Price_Leadership.pdf
- Godley, W.A.H, and W.D. Nordhaus. 1972. "Pricing in the Trade Cycle". *The Economic Journal*, vol 82 September: 853-882.
- Hall, R.L., and C.J. Hitch. 1939. "Price Theory and Business Behaviour". *Oxford Economic Papers* 2 (May): 12-45.
- Harrod, R.F. 1952. *Economic Essays*. Harcourt, Brace and cie, New York
- Heflebower, Richard B. 1955. "Full Costs, Cost Changes, and Prices" in *Business Concentration and Price Policy*. Princeton University Press.
- Hall Robert E. (1986) "Market Structure and Macroeconomic Fluctuations". *Brookings Papers on Economic Activity*, n°2: 285-338.
- Jael, Paul (2014) "Full Cost, Price and Competition" *MPRA*. www.mpra.ub.uni-muenchen.de/59630/
- Jael, Paul (2015) "Price, Target Rate of Profit and Entry Prevention" *MPRA*. www.mpra.ub.uni-muenchen.de/65970
- Keen Steve. (2011), *L'imposture économique*. Editions de l'atelier, Ivry sur Seine, 2014
- Lanzillotti, Robert F. 1957. "Competitive Price Leadership- A Critique of Price Leadership Models". *The Review of Economics and Statistics*, vol. 34, 55-64
- Lanzillotti, Robert F. 1958. "Pricing Objectives in Large Companies". *American Economic Review* 18 (5) December: 921-940.
- Lee, F.S. 1999. *Post Keynesian Price Theory*. Cambridge University Press (Virtual Publishing). Cambridge
- Lucas Robert E. Jr (1977) "Understanding Business Cycles". *Carnegie-Rochester Conference Series on Public Policy*, vol 5:. 7-29.
- Machin, Stephen, and John Van Reenen.1993. "Profit Margins and the Business Cycle: Evidence from UK Manufacturing Firms". *The Journal of Industrial Economics* 41 (1): 29-50

- Modigliani, Franco. 1958. "New Developments on the Oligopoly Front". *Journal of Political Economy*, 66(3) June, 215-232
- Nubbemeyer, Elmar. 2010, *A Reconsideration of Full-Cost Pricing*. www.edoc.ub.uni-muenchen.de/12313/2/nubbemeyer_Elmar.pdf.
- Ray, Korok, and Jacob Gramlich. 2012. *Full-Cost Pricing and Economic Pricing: Reconciling Two Approaches*. www.korokray.files.wordpress.com/2012/11/fcpep.pdf
- Robinson, Joan. 1946. *The Economics of Imperfect Competition*. Macmillan and co, London.
- Rotemberg, Julio J, and Michael Woodford. 1999. "The Cyclical Behavior of Prices and Costs". *NBER Working Paper Series*. Working paper 6909. www.nber.org/papers/w6909
- Rotemberg, Julio J. 1982. "Sticky Prices in the United States". *The Journal of Political Economy* 90 (6): 1187-1211.
- Simon, Herbert A. 1978. "Rational Decision-Making in Business Organizations". *Nobel Prize in Economics Documents 1978-1*.
- Spiegel, Yossi, and Konrad Stahl. 2014. *Industry Structure and Pricing over the Business Cycle*. www.tau.ac.il/spiegel/papers/Spiegel-stahl-CRESSE.pdf
- Sraffa, Piero. 1925. *On the Relations Between Cost and Quantity Produced*. Ed Langer & Lee Chicago Illinois.
- Stigler, Georges J. 1957. "Perfect Competition, Historically Contemplated". *Journal of Political Economy*. 65: 1-17
- Sylos-Labini. 1962. *Oligopoly and Technical Progress*. Harvard University Press, Cambridge Massachussetts
- Sylos-Labini, Paolo. 1971. « La théorie des prix en régime d'oligopole et la théorie du développement ». *Revue d'économie politique*. 81 (2) : 244-272.
- Sylos-Labini, Paolo. 2007. "Oligopoly: Static and Dynamic Analysis". *Revue d'économie Industrielle*, 118 (2e trimestre): 91-107.
- Viner, Jacob. 1932. "Cost Curves and Supply Curves". *Zeitschrift für Nationalökonomie*, bd III Hft 1 Sonderabdruck, 23-46.
- Wicksell, Knut. 1934. *Lectures on Political Economy. Volume One: General Theory*. Routledge & Kegan London